

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Jennifer Q. Trelewicz

Application No.: 09/993,188

Group No.: 2625

Filed: 11/14/2001

Examiner: Scott A. Rogers

For: RASTER DATA COMPRESSION APPARATUS AND METHOD

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Commissioner for Patents

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**AMENDMENT
RESPONSE TO FINAL OFFICE ACTION**

Introductory Comments

In response to the final Office Action mailed April 23, 2007, please consider the following amendments and remarks.

Amendment to the specification:

Please amend the paragraph on page 8, lines 8-17 as follows:

Figure 3 illustrates one embodiment of a raster compression system 300 of the present invention. The raster compression system 300 includes a CIC card 220 in electrical or optical communication with a MIC card 230. In the depicted embodiment, the CIC card is shown including a raster compression module 310 and a packet formatting module 312. The MIC card 230 is shown including a raster decompression module 310 and a packet formatting module 312. The MIC card 230 is shown including a raster decompression module 320 and a packet deformating module 318. In the depicted embodiment, the raster compression system 330 receives a raster stream 212 of raster data that is preferably bi-toned. The raster stream 212 may be associated with a print component such as cyan, magenta, yellow or black. For example, the raster data may toggle the print mechanism between printing and not printing, thus selecting between the print component and a background color such as white.

Claim Amendments

Please amend the claims as follows:

1. (Currently Amended) An apparatus for lossless compression of bi-tonal raster data, the apparatus comprising:

a data channel configured to carry a raster data stream from a print controller to a print mechanism;

a plurality of pattern detection modules, including an edge pattern detection module, operably connected to the data channel and configured to receive raster data, each of the pattern detection modules further configured to detect a separate type of pattern in the raster data, each pattern capable of a separate lossless representation; and

a formatting module configured to place the lossless representations into a compressed data stream, and to segment the compressed data stream into a plurality of packets, each packet comprising a fixed length header field and a variable length data field.

2. (Original) The apparatus of claim 1, further comprising a pattern selection module configured to select the lossless representation that is most compact.

3. (Original) The apparatus of claim 1, wherein one of the patterns comprises verbatim data, and further comprising a verbatim data transfer module configured to receive raster data, and provide verbatim raster data, the verbatim raster data being an identical and lossless representation of the raster data.

4. (Original) The apparatus of claim 1, wherein the plurality of pattern detection modules further comprises a solid pattern detection module.

5. (Original) The apparatus of claim 1, wherein the plurality of pattern detection modules further comprises a half-tone pattern detection module.

6. (Cancelled)

7. (Currently Amended) The apparatus of claim [[6]] 1, wherein the fixed length header field is configured to contain a plurality of codes representing a plurality of pattern types corresponding to the plurality of pattern detection modules.

8. (Original) The apparatus of claim 7, wherein the plurality of codes comprises a 00 code representing a solid ON pattern, a 01 code representing a solid OFF pattern, a 10 code representing an edge pattern, and a 11 code representing verbatim raster data.

9. (Original) The method of claim 7, wherein the plurality of codes comprises a 0 code representing solid patterns, and 1 code representing other patterns.

10. (Original) The apparatus of claim 1, further comprising a plurality of pattern extraction modules configured to extract the selected lossless representations from the data channel.

11. (Original) The apparatus of claim 1, wherein the pattern detection modules and the formatting module are configured to detect and format the raster data in a single pass.

12. (Currently Amended) An apparatus for decompressing losslessly compressed bi-tonal raster [[data]] data, the apparatus comprising:

a data channel configured to carry a compressed raster data stream from a print controller to a print mechanism;

a plurality of decompression modules operably connected to the data channel and configured to generate raster data from compressed raster data, one of the decompression modules being a verbatim data transfer module configured to generate raster data that is identical to the compressed raster data, another decompression module being an edge pattern generation module; [[and]]

a pattern decoding module configured to receive a pattern identifier and activate one of the plurality of decompression modules; and

a deformatting module configured to parse packets, each packet comprising a fixed length header field and a variable length data field.

13. (Original) The apparatus of claim 12, wherein the plurality of pattern generators further comprises a solid pattern generator.

14. (Original) The apparatus of claim 12, wherein the plurality of pattern generators further comprises a half-tone pattern generator.

15. (Cancelled)

16. (Currently Amended) The apparatus of claim [[15]] 12, wherein the fixed length header field is configured to contain a plurality of codes representing a plurality of patterns corresponding to the plurality of decompression modules.

17. (Original) The apparatus of claim 16, wherein the plurality of codes comprises a 00 code representing a solid ON pattern, a 01 code representing a solid OFF pattern, a 10 code representing an edge pattern, and a 11 code representing verbatim raster data.

18. (Original) The method of claim 17, wherein the plurality of codes comprises a 0 code representing solid patterns, and a 1 code representing other patterns.

19. (Currently Amended) A method for lossless compression of bi-tonal raster data, the method comprising:

receiving a raster data stream containing raster data from a print controller;

detecting a plurality of patterns in the raster data, including edge patterns; ~~and~~

generating lossless representations of the raster data based upon the plurality of patterns;

and

formatting the lossless representations into packets, each packet comprising a fixed length header field and a variable length data field.

20. (Original) The method of claim 19, wherein detecting a plurality of patterns and generating the lossless representations are conducted in a single pass.

21. (Original) The method of claim 19, wherein detecting a plurality of patterns further comprises detecting solid patterns.

22. (Original) The method of claim 19, wherein detecting a plurality of patterns further comprises detecting half-tone patterns.

23. (Original) The method of claim 19, further comprising selecting the lossless representations to be generated based upon a criterion of compactness.

24. (Cancelled)

25. (Currently Amended) The method of claim [[24]] 19, wherein formatting the compressed raster stream further comprises placing a plurality of codes in the packets, each code of the plurality of codes representing one of a plurality of patterns.

26. (Original) The method of claim 25, wherein the plurality of codes comprises a 00 code representing a solid ON pattern, a 01 code representing a solid OFF pattern, a 10 code representing an edge pattern, and a 11 code representing verbatim raster data.

27. (Original) The method of claim 25, wherein the plurality of codes comprises a 0 code representing solid patterns, and 1 code representing other patterns.

28. (Currently Amended) A method for decompressing losslessly compressed bi-tonal raster data, the method comprising:

receiving a pattern identifier and pattern data from a print controller;
providing a plurality of pattern generation procedures including an edge pattern generation procedure; ~~and~~
executing a pattern generation procedure selected according to the pattern identifier to provide decompressed raster data from the pattern data; and
deformatting the packets, including deformatting a fixed length header field and a variable length data field.

29. (Original) The method of claim 28, wherein executing a pattern generation procedure comprises executing a solid pattern generation procedure.

30. (Original) The method of claim 28, wherein executing a pattern generation procedure comprises executing a half-tone pattern generation procedure.

31. (Original) The method of claim 30, wherein executing the half-tone pattern generation procedure comprises indexing a codebook.

32. (Cancelled)

33. (Currently Amended) The method of claim ~~[[32]]~~ 28, wherein the fixed length header field is configured to contain a plurality of codes representing a plurality of patterns corresponding to the plurality of decompression modules.

34. (Original) The method of claim 33, wherein the plurality of codes comprises a 00 code representing a solid ON pattern, a 01 code representing a solid OFF pattern, a 10 code representing an edge pattern, and a 11 code representing verbatim raster data.

35. (Original) The method of claim 33, wherein the plurality of codes comprises a 0 code representing solid patterns, and a 1 code representing other patterns.

Remarks/Arguments

Claims 1-35 are pending. In the final Office Action mailed on April 23, 2007, the Examiner rejected claims 1-5, 12-14, 19-23, and 28-31 under 35 USC §103(a) as unpatentable over Fallon (U.S. Patent No. 6,624,761 B2) and Kageyama et al. (U.S. Patent No. 6,567,180 B1) in view of Uchida et al. (U.S. Patent No. 6,744,921 B1). The Examiner objected to claims 6-11, 15-18, 24-27 and 32-35 as being dependent upon a rejected base claim, but stated these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants have amended claims 1, 12, 19 and 28 to incorporate the limitations of allowable dependent claims 6, 15, 24 and 32. Applicants have cancelled claims 6, 15, 24 and 32. Applicants also amended claims 7, 16, 25 and 33 depend upon claims 1, 12, 19 and 28. Applicants amended the specification to correct a typographical error.

Applicants submit that independent claims 1, 12, 19 and 28 are allowable based upon the incorporation of the limitations from allowable dependent claims 6, 15, 24 and 32. Applicants further submit that all remaining dependent claims are now allowable at least as depending upon an allowable base claim. Applicants respectfully traverse the rejections and objections and request reconsideration and withdrawal thereof.

Conclusion

Applicants have amended independent claims 1, 12, 19 and 28 and dependent claims 7, 16, 25 and 33. Applicants have cancelled claims 6, 15, 24 and 32. Applicants maintain that all amended independent claims 1, 12, 19 and 28 are now allowable over all prior art of record (considered individually or in any combination). Further, remaining dependent claims 2-5, 7-11, 13-14, 16-18, 20-23, 25-27, 29-31 and 33-35 are also allowable for the same reasons discussed above and as depending from allowable base claims. Still further, dependent claims 2-5, 7-11, 13-14, 16-18, 20-23, 25-27, 29-31 and 33-35 recite additional limitations not disclosed by the prior art.

Even though this is an Amendment After Final, entry of the amendments is requested as they are submitted to raise no new issues and to place the claims in a condition for allowance. In view of the amendments and arguments, favorable consideration and allowance of all remaining claims respectfully requested.

Respectfully submitted,

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